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Title of project: Continuous glucose monitoring to support people on oral antidiabetic treatment

ABSTRACT
The objective of type 2 diabetes management is to delay onset and slow progression of diabetes late complications. The interventions used in the management are both non-pharmacological, consisting of lifestyle changes to control risk factors, and pharmacological. New oral antidiabetic medications, such as oral semaglutide, have shown promising results with respect to control of blood glucose and of other risk factors, such as, blood pressure and weight. Despite of these advantages, the rather complex dosing instructions lead to suboptimal treatment. Development of a decision support system (DSS), providing the patient with personalised guidance on administration of oral antidiabetic medications, could aid the patient and increase the effect of the treatment. The DSS could be based on information gathered by continuous glucose monitoring (CGM) sensors and activity trackers, as these sources can be used to generate highly valid patient profiles enabling automated patient guidance. A DSS to guide these patients with optimal administration and increased adherence would thus have a high impact both on the individual and the society. As no studies have been conducted to monitor patients dosed with oral semaglutide using CGM, a 3-months pilot study will be planned and executed as part of the PhD project to gather CGM, activity tracker, diary, and questionnaire data. The pilot study will include 20 people with type 2 diabetes and be conducted at Steno Diabetes Center North Denmark. The data obtained from the pilot study will be analysed using explainable machine learning combined with feature elimination methods to identify predictors and events deemed important for the dosing instruction of oral semaglutide. The results of the data analysis will be implemented in a DSS, which will be evaluated in regard to whether it increases the patient's adherence and leads to better treatment efficacy. A 150 patients 3-arm clinical trial of oral semaglutide alone versus oral semaglutide+CGM versus oral semaglutide+CGM+DSS will be prepared to further evaluate the DSS. The process from pilot study to development of the DSS is expected to have a duration of approximately three years and requires qualifications within the field of health, data science, and technology. Thus, this research study is a perfect fit for a PhD project with a candidate from Biomedical Engineering and Informatics.